

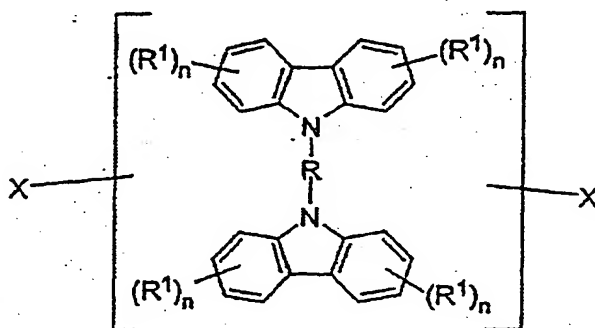
What is claimed is:

1. Mixtures (blends) comprising

- (A) at least one conjugated polymer,
 (B) at least one bridged carbazole unit and
 (C) at least one triplet emitter.

2. The mixture as claimed in claim 1, characterized in that it contains at least 0.5% by weight of at least one conjugated polymer, at least 1% by weight of at least one bridged carbazole unit and at least 0.1% by weight of at least one triplet emitter.

3. The mixture as claimed in claim 1 and/or 2, characterized in that the mixture comprises, as the bridged carbazole unit, at least one compound of the formula (I)



FORMULA (I)

where the symbols and indices are defined as follows:

R is the same or different at each instance and is a straight-chain, branched or cyclic alkylene chain which has from 1 to 40 carbon atoms and may be R¹-substituted or unsubstituted, in which one or more nonadjacent carbon atoms may also be replaced by —NR²—, —O—, —S—, —CO—, —CO—O—, —CO—NR²—, —O—CO—O—, or is a bivalent, aromatic or heteroaromatic ring system which has from 2 to 40 carbon atoms and may be R¹-substituted or unsubstituted, an R¹-substituted or unsubstituted vinylene unit, an acetylene unit or a combination of from

2 to 5 of these systems; the aromatic units may also be part of a larger fused system; the possible substituents R^1 may optionally be situated at any free position;

5 R^1 is the same or different at each instance and is a straight-chain, branched or cyclic alkyl or alkoxy chain having from 1 to 22 carbon atoms, in which one or more nonadjacent carbon atoms may also be replaced by $-NR^2-$, $-O-$, $-S-$, $-CO-O-$, $-O-CO-O-$, in which one or more hydrogen atoms may also be replaced by fluorine, or is an aryl or aryloxy group having from 5 to 40 carbon atoms, in which one or more carbon atoms may also be replaced by O, S or N, and which may also be substituted by one or more nonaromatic R^1 radicals, a vinyl or acetylene group or F, Cl, Br, I, NO_2 , CN, $N(R^2)_2$, $B(R^2)_2$, $Si(R^2)_3$, and two or more R^1 radicals together may also form an aliphatic or aromatic, mono- or polycyclic ring system;

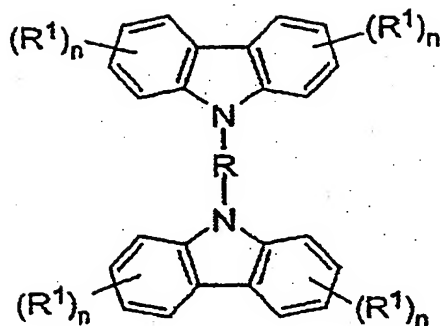
10 R^2 is the same or different at each instance and is H, a straight-chain, branched or cyclic alkyl chain having from 1 to 22 carbon atoms, in which one or more nonadjacent carbon atoms may also be replaced by O, S, $-CO-O-$, $-O-CO-O-$, and in which one or more hydrogen atoms may also be replaced by fluorine, or is an aryl group having from 5 to 40 carbon atoms, in which one or more carbon atoms may also be replaced by O, S or N and which may also be substituted by one or more nonaromatic R^2 radicals;

15 two or more R^2 radicals together may also form a ring system;

20 n is the same or different at each instance and is 0, 1, 2, 3 or 4, with the proviso that n must not be 4 when there is a linkage to the polymer chain (i.e. X) on this phenyl unit, and that n must not be 3 or 4 when both linkages to the polymer chain (i.e. X) are on this phenyl unit;

25 X describes the linkage of the unit to the conjugated polymer,

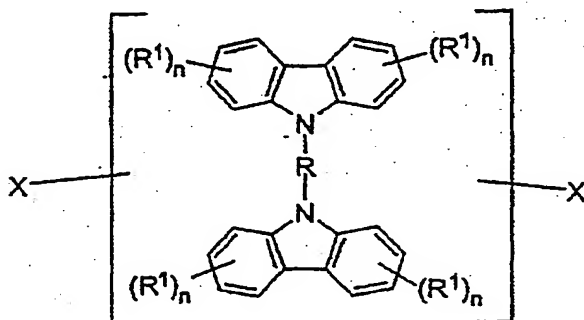
30 and/or of the formula (II)



FORMULA (II)

where the symbols R, R¹, R² and the indices n are each as defined under formula (I).

4. Mixtures BLEND1 as claimed in one or more of claims 1 to 3, containing
- (A) 5-99.5% by weight of at least one conjugated polymer POLY1 which contains 1-100 mol% of one or more units of the formula (I)



FORMULA (I)

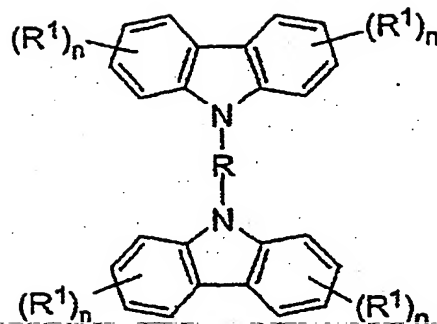
where the symbols and indices are each defined as described under claim 3; and

- (B) 0.1-95% by weight of one or more triplet emitters (COMP1).

5. Mixtures BLEND2 as claimed in one or more of claims 1 to 3, containing
- (A) 0.5-99% by weight of at least one conjugated polymer POLY2 which contains, in covalently bonded form, 0.1-100 mol% of one or more triplet emitters (COMP2)

and

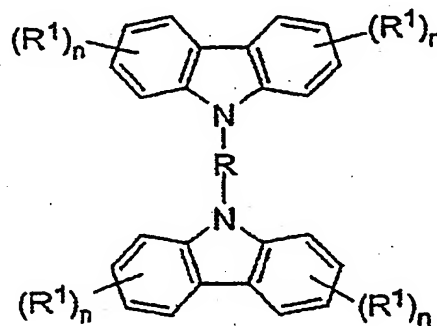
- (B) 1-99.5% by weight of a structural unit of the formula (II)



FORMULA (II)

where the symbols and indices are each as defined in claim 3.

- 5 6. Mixtures BLEND3 as claimed in one or more of claims 1 to 3, containing
- (A) 0.5-98.5% by weight of any conjugated polymer POLY3;
- and
- (B) 1-99% by weight of a structural unit of the formula (II)



FORMULA (II)

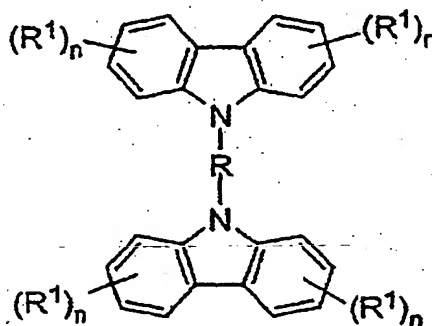
where the symbols and indices are each as defined in claim 3,
and

- (C) 0.1-95% by weight of one or more triplet emitters (COMP1).

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7. Mixtures BLEND4 as claimed in one or more of claims 1 to 3, containing
- (A) 0.5-98.5% by weight of any conjugated polymer POLY3 or a plurality thereof;
- and
- 20 (B) 1.5-99.5% by weight of a compound COMP3 which contains one or

more triplet emitters bonded covalently to at least one structural unit of the formula (II)



FORMULA (II)

- 5 where the symbols and indices are each as defined in claim 3 and the bond between the triplet emitter and the structural unit of the formula (II) may be at any positions in the triplet emitter and in the structural unit of the formula (II).
8. Mixtures as claimed in one or more of claims 1 to 7, characterized in that the structural units of the formula (I) are incorporated into POLY1 via the 3,6-position or the 2,7-position of a carbazole.
9. Mixtures as claimed in one or more of claims 1 to 8, characterized in that the structural units of the formula (I) are incorporated into POLY1 via the 3,3'-position or the 2,2'-position of the two carbazole units when R describes an aryl, heteroaryl, vinyl or acetylene unit or a combination of these systems.
10. Mixtures as claimed in one or more of claims 1 to 9, characterized in that the structural units of the formula (I) are incorporated into POLY1 via the bridge R or via one or two substituents R^1 when R and R^1 describe an aryl, heteroaryl, stilbenyl or tolanyl unit or a combination of these systems.
11. Mixtures as claimed in one or more of claims 1 to 10, characterized in that the further structural elements of the polymers POLY1 to POLY3 are selected from the groups of ortho-, meta- or para-phenylenes, 1,4-naphthylenes, 9,10-anthracenylenes, 2,7-phenanthrenylenes, 1,6- or 2,7- or 4,9-pyrenes or 2,7-

tetrahydropyrenes, oxadiazolylenes, 2,5-thiophenylenes, 2,5-pyrrolylenes, 2,5-furanylenes, 2,5-pyridylenes, 2,5-pyrimidinyls, 5,8-quinolinylenes, fluorenes, spiro-9,9'-bifluorenes, indenofluorenes or heteroindenofluorenes.

- 5 12. Mixtures as claimed in one or more of claims 1 to 11, characterized in that further structural elements which improve the charge transport and/or the charge injection and/or the charge equilibrium are present in the polymers POLY1 to POLY3.
- 10 13. Mixtures as claimed in claim 12, characterized in that the further structural elements are selected from the groups of the triaryl amines or the oxadiazolylenes.
- 15 14. Mixtures as claimed in one or more of claims 1 to 13, characterized in that the symbols and indices of the formula (I) are:
- R is the same or different at each instance and is a straight-chain or branched alkyl chain which has from 3 to 10 carbon atoms and may be unsubstituted or R¹-substituted, in which one or more nonadjacent carbon atoms may also be replaced by -N-R²-, -O- or -S-, a bivalent aromatic or heteroaromatic ring system selected from thiophene, benzene, biphenyl, naphthalene, anthracene or phenanthrene, each of which is unsubstituted or substituted by one or two substituents R¹, a 9,9'-substituted fluorene, a spirobifluorene substituted by from 0 to 4 substituents R¹, a 9,10- or 9,9,10,10-substituted dihydrophenanthrene, a stilbenyl or tolanyl system which bears from 0 to 2 substituents R¹ at the free positions, or combinations of 2 or 3 of these systems;
- R¹, R² are each as described in claim 3;
- n is the same or different at each instance and is 0, 1 or 2;
- the linkage to the polymer chain is via the 3,6- or the 2,7-position or via the 3,3'-position when R is an aryl, heteroaryl, stilbenyl or tolanyl system, or via two positions on R itself or on R¹ when R or R¹ is an aryl, heteroaryl, stilbenyl or tolanyl system, so that the number of aromatic atoms between the points of linkage is a multiple of four, and that the symbols and indices of the formula
- 20
- 25
- 30

(II) are:

R is the same or different at each instance and is a straight-chain or branched alkyl chain which has from 3 to 10 carbon atoms and may be unsubstituted or R¹-substituted, in which one or more nonadjacent carbon atoms may also be replaced by -N-R²-, -O- or -S-, a bivalent aromatic or heteroaromatic ring system selected from thiophene, benzene, biphenyl, naphthalene, anthracene or phenanthrene, each of which is unsubstituted or substituted by one or two substituents R¹, a 9,9'-substituted fluorene, a spirobifluorene substituted by from 0 to 4 substituents R¹, a 9,10- or 9,9,10,10-substituted dihydrophenanthrene, a stilbenyl or tolanyl system which bears from 0 to 2 substituents R¹ at the free positions, or combinations of 2 or 3 of these systems;

R¹, R² are each as described in claim 3;

n is the same or different at each instance and is 0, 1 or 2.

15. Mixtures as claimed in one or more of claims 1 to 14, characterized in that the structural elements of the formula (I) are selected from the formulae (III) to (XXXVIII) which may be substituted or unsubstituted.

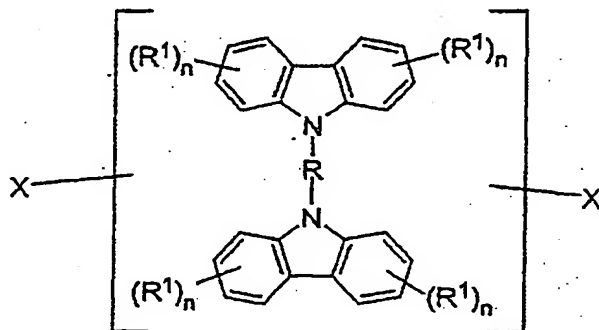
16. Mixtures as claimed in one or more of claims 1 to 15, characterized in that the structural elements of the formula (II) are selected from the formulae (XXXIX) to (LVIII) which may be substituted or unsubstituted.

17. Mixtures as claimed in one or more of claims 1 to 16, characterized in that the triplet emitter contains heavy atoms, i.e. atoms from the periodic table of the elements having an atomic number of more than 36.

18. Mixtures as claimed in claim 17, characterized in that the triplet emitter comprises d and/or f transition metals.

19. Mixtures as claimed in claim 18, characterized in that the triplet emitter comprises metals of groups 8 to 10, in particular Ru, Os, Rh, Ir, Pd and/or Pt.

20. Mixtures as claimed in one or more of claims 1 to 19, characterized in that the triplet emitter (COMP2) is incorporated into the main chain of the polymer (POLY2).
- 5 21. Mixtures as claimed in one or more of claims 1 to 19, characterized in that the triplet emitter (COMP2) is incorporated into the side chain of the polymer (POLY2).
- 10 22. Mixtures as claimed in one or more of claims 1 to 21, characterized in that any further molecules, which may be low molecular weight, oligomeric, dendritic or polymeric, may also be added to the mixtures as claimed in claim 4 (BLEND1), claim 5 (BLEND2), claim 6 (BLEND3) or claim 7 (BLEND4).
- 15 23. Mixtures as claimed in one or more of claims 1 to 22, characterized in that structural units of the formula (II) are additionally added to the mixture as claimed in claim 4 (BLEND1), or claim 7 (BLEND4).
- 20 24. Mixtures as claimed in claim 23, characterized in that the total content of structural units of the formula (I) and formula (II) is 20-99 mol%.
- 25 25. Conjugated polymers (POLY4) containing
(A) 1-99.9 mol% of units of the formula (I)



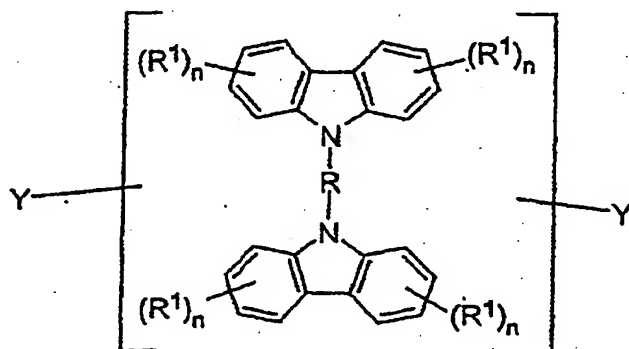
FORMULA (I)

where the symbols and indices are each as defined in claim 3, and

(B) 0.1-95 mol% of one or more triplet emitters.

26. Mixtures of at least one polymer as claimed in claim 25, characterized in that further molecules, which may be low molecular weight, oligomeric, dendritic or polymeric, may be added to the polymer (POLY4).

27. Compounds of the formula (LIX)



FORMULA (LIX),

characterized in that the two functional groups Y are the same or different and copolymerize under conditions for C-C or C-N bond formations, and the further symbols and indices are each as defined in claim 3.

28. Compounds as claimed in claim 27, characterized in that Y is selected from the groups of Cl, Br, I, O-tosylate, O-triflate, OSO_2R^2 , $\text{B}(\text{OH})_2$, $\text{B}(\text{OR}^2)_2$, $\text{Sn}(\text{R}^2)_3$ and NHR^2 , where R^2 is as defined in claim 3.

29. Compounds as claimed in claim 27 and/or 28, characterized in that the C-C or C-N bond formations are selected from the groups of the SUZUKI coupling, the YAMAMOTO coupling, the STILLE coupling and the HARTWIG-BUCHWALD coupling.

30. Compounds as claimed in one or more of claims 27 to 29, characterized in that the monomeric compounds of the formula (LIX) lead in the polymer to structural units of the formula (III) to (XXXVIII).

31. The use of a mixture or of a polymer as claimed in one or more of claims 1 to 26 in organic light-emitting diodes (OLEDs), organic solar cells (O-SCs), organic laser diodes (O-laser), organic optical detectors or in nonlinear optics.
- 5 32. An electronic component which comprises one or more active layers, at least one of these layers comprising one or more mixtures or polymers as claimed in one or more of claims 1 to 26.
- 10 33. The electronic component as claimed in claim 32, characterized in that it is an organic light-emitting diode, organic solar cell, organic laser diode, an organic optical detector or a device for nonlinear optics.